Amendments to Claims

1 - 20 (cancelled)

21. (new) An aircraft capable of both conventional and vertical take off and landing (VTOL) flight comprising:

a fuselage;

a set of canard wings mounted at or below the fuselage at the front of the aircraft;

two sets of wings, including a bottom wing and top wing mounted in biplane fashion, the bottom wing mounted so that the wing center of lift is located slightly ahead of the aircraft center of gravity, the top wing mounted so that the top wing center of lift is located slightly behind the aircraft center of gravity, and the bottom wing and top wing mounted so that the combined center of lift from the bottom wing and top wing is at the aircraft center of gravity;

an exbedded ducted fan mounted in a large circular opening in the center of said top wing wherein exbedded means the duct diameter extends beyond the outer edge of the fuselage at the center of the top wing, the exbedded ducted fan including a shroud having a ducted fan bellmouth and a rotor disposed in the shroud, said bottom wing having a central opening for the exhaust airstream from the ducted fan and said central opening extending rearward and being larger than the circular opening in the top wing;

a horizontal stabilizer mounted to the rear and above the top wing;

a central tailfin mounted above and behind the ducted fan bellmouth and supporting the horizontal stabilizer, said central tailfin mounted on top of the rear third of the fuselage to form a "T" tail with the horizontal stabilizer; and

a first rudder mounted in the central tailfin.

22. (new) The aircraft of claim **21**, wherein said horizontal stabilizer has a surface area ranging between 25% to 60% of the biplane wing surface area.

23. (new) The aircraft of claim **21**, wherein said central tailfin has a total surface area ranging between 25% to 60% of the biplane wing surface area.

24. (new) The aircraft of claim **23**, wherein the first rudder mounted in the central tailfin has a total surface area ranging between 25% to 60% of said total surface area of the central tailfin.

25. (new) The aircraft of claim **21**, further comprising:

two near vertical, airfoil-shaped planar support structures called sidefins connecting said biplane wings together at the wingtips, said two sidefins extending to further connect to the wingtips of the horizontal stabilizer; and

second and third rudders mounted in each of the two sidefins.

26. (new) The aircraft of claim **25**, wherein said central tailfin and two sidefins have a total surface area ranging between 25% to 60% of the biplane wing surface area.

27. (new) The aircraft of claim **26**, wherein the first, second, and third rudders have a total surface area of ranging between 25% to 60% of said total surface area of the central tailfin and two sidefins.

28. (new) The aircraft of claim **25**, further comprising a vertically oriented propulsion shaft connected to the rotor, said propulsion shaft projecting downward into the center of the fuselage and located at the aircraft center of lift of the biplane wings and at the aircraft center of gravity, to provide vertical lift propulsion; wherein:

the exbedded ducted fan shroud has an inside diameter extending beyond the diameter of the fuselage;

the ducted fan shroud bellmouth having a radius of up to 0.3 times the ducted fan diameter;

the ducted fan shroud being a direct structural support for the top wing, and indirectly for the bottom wing.

29. (new) The aircraft of claim **28**, further comprising fin control over pitch, yaw and roll while in VTOL mode including:

center of gravity adjustment pitch deflectors to provide for adjustments to the center of VTOL lift;

exbedded airpath roll/yaw control vanes to provide aircraft control of yaw and roll while in the VTOL mode of flight, said vanes mounted outside the fuselage while inside the diameter of the ducted fan;

imbedded and canted pitch control vanes to provide aircraft control of pitch while in the VTOL mode of flight; and

three to four mid-section anti-torque airfoil-shaped vanewings, providing horizontal thrust to create a torque effect opposite to that produced by the aircraft engines and ducted fan rotor.

30. (new) The aircraft of claim **25**, further comprising airfoil-shaped, near-vertical wing support panel structures called midriggers connecting said biplane wings to each other, said midriggers positioned longitudinally tangent to the outer radius of the large circular opening in the center of said top wing.

31. (new) The aircraft of claim **30**, further comprising horizontal propulsive means to provide forward motion.

32. (new) The aircraft of claim **31**, wherein said horizontal propulsive means comprises a tractor propeller mounted over the rear section of the ducted fan shroud bellmouth to assist aerodynamic controls in compensation to the pitch up experienced in ducted fan aircraft in the transition from VTOL to conventional flight.

33. (new) The aircraft of claim **32**, further comprising aerodynamic controls for a transitional flight regime comprising:

a three control surface elevator including a central third section between two outer third sections, the three control surface elevator covering the full wingspan of the aircraft, the central third of the elevator being in the slipstream of the tractor to be used to enhance aircraft stability in pitch during engine throttle adjustments in a conventional flight regime, the two outer third sections acting as conventional elevator surfaces, said elevator having a surface area range of 25% to 50% of the surface area of the horizontal stabilizer to provide satisfactory aerodynamic control of pitch;

flaps on the bottom wing of the biplane set of wings; and

ailerons on the top wing of the biplane set of wings, said bottom wing having a rear part and no lifting surfaces on the rear part of the bottom wing inside the midriggers.

34. (new) The aircraft of claim **33**, further comprising an engine throttle, wherein the elevator adjusts when the engine throttle changes position to compensate for the downward force on the nosegear of the aircraft impressed by the thrust from the forward propulsion system.

35. (new) The aircraft of claim **34**, wherein an incremental change in position of the pitch and roll/yaw control vanes results in a change in position of the throttle to compensate for the increased drag and redirected thrust vector of the vanes.

36. (new) The aircraft of claim **31**, wherein said horizontal propulsive means comprises a pusher propeller mounted over the rear section of the ducted fan shroud bellmouth, to assist aerodynamic controls in compensation to the pitch up experienced in ducted fan aircraft in the transition from VTOL to conventional flight.

37. (new) The aircraft of claim **36**, further comprising aerodynamic controls for a transitional flight regime comprising:

a three control surface elevator including a central third section between two outer third sections, the three control surface elevator covering the full wingspan of the aircraft, the central third of the elevator being in the slipstream of the pusher propeller to be used to enhance aircraft stability in pitch during engine throttle adjustments in a conventional flight regime, the two outer third sections acting as conventional elevator surfaces, said elevator having a surface area range of 25% to 50% of the surface area of the horizontal stabilizer to provide satisfactory aerodynamic control of pitch;

flaps on the bottom wing of the biplane set of wings; and

ailerons on the top wing of the biplane set of wings, said bottom wing having a rear part and no lifting surfaces on the rear part of the bottom wing inside the midriggers.

38. (new) The aircraft of claim **37**, further comprising an engine throttle, wherein the elevator adjusts when the engine throttle changes position to compensate for the downward force on the nosegear of the aircraft impressed by the thrust from the forward propulsion system.

39. (new) The aircraft of claim **38**, wherein an incremental change in position of the pitch and roll/yaw control vanes results in a change in position of the throttle to compensate for the increased drag and redirected thrust vector of the vanes.

40. (new) The aircraft of claim **31**, wherein said horizontal propulsive means comprises a turbofan jet engine mounted over the rear section of the ducted fan shroud bellmouth, to assist aerodynamic controls in compensation to the pitch up experienced in ducted fan aircraft in the transition from VTOL to conventional flight.

41. (new) The aircraft of claim **31**, wherein said horizontal propulsive means comprises a turboprop jet engine mounted over the rear section of the ducted fan shroud bellmouth.

42. (new) The aircraft of claim **25**, wherein:

the two sidefins have front and rear edges extending linearly to the front and rear edges of the bottom wing wingtips, respectively, and then to the front and rear edges of the top wing wingtips, and then to the front and rear of the wingtips of the horizontal stabilizer;

the two sidefins have top curvature between the top wing and horizontal stabilizer curved concavely in an "S" shaped curve, to reduce the amount of sidefin area exposed to crosswinds pressing against the sidefins above the aircraft lateral center of gravity; and

the two sidefins have dorsal extensions extending below the bottom wing, to add surface area to the sidefins below the aircraft lateral center of gravity, the purpose of the "S" shaped curve and dorsal extensions being to lower the center of pressure of the sidefins to below the center of gravity of the aircraft.

43. (new) The aircraft of claim **30**, wherein said midriggers are parallel to the fuselage and airflow, to connect the top and bottom wings for structural support and enhanced vertical thrust, on both sides of the aircraft; said midriggers canted so that the bottom of the midriggers is located further outboard than the top of said midriggers, the angle between a vertical line and the midriggers to be between 3 and 10 degrees.

44. (new) The aircraft of claim **43**, wherein the midriggers have dorsal fins extending below the bottom wing to enhance vertical thrust recapture.

45. (new) The aircraft of claim **25**, further comprising:

horizontal propulsive means to provide forward motion and either a single engine or two engines driving both the exbedded ducted fan and the horizontal propulsive means; and

two clutches to transfer power incrementally between the ducted fan rotor and the horizontal propulsive means, wherein said clutches are mounted with said engines to transmit power through a driveshaft, said driveshaft being mounted on a drivetrain truss.

46. (new) The aircraft of claim **45**, wherein the horizontal propulsive means comprises a tractor propeller and transfer of engine power is made using the two clutches, including a first clutch, called the VTOL clutch, to control activation of engine power to the exbedded ducted fan rotor, and a second clutch, called the conventional flight clutch, to control the activation of engine power to the tractor propeller.

47. (new) The aircraft of claim **45**, wherein the horizontal propulsive means comprises a pusher propeller and transfer of engine power is made using the two clutches, including a first clutch, called the VTOL clutch, to control activation of engine power to the exbedded ducted fan rotor, and a second clutch, called the conventional flight clutch, to control the activation of engine power to the pusher propeller.

48. (new) The aircraft of claim **47**, wherein the two clutches are controlled by a single floor mounted foot pedal and trimmed using two instrument, floor, sidewall or ceiling mounted trim levers for controlling the relative rate of mix of clutch engagement/disengagement between the two clutches.

49. (new) The aircraft of claim **25**, further comprising collapsing passenger seats which have a two-stage collapsing mechanism, wherein the rear of the seat fails backward at a G loading of 5 to 10 G's, said collapsing mechanism comprising a Euler column which collapses at 5 G's, an aluminum honeycomb block under the seat collapsing at 5-10 G's, a double sliding armrest support tube collapsing at 10 G's allowing the seat to recline, and once reclined, continuing to fail through the collapse of another higher density aluminum honeycomb at controlled rate of 30 G's deceleration.

50. (new) The aircraft of claim **25**, further comprising a main wing fuel tank in the biplane wings and a canard wing fuel tank in the canard wings, wherein fuel in the canard wing fuel tank can be transferred to the main wing fuel tank.

51. (new) The aircraft of claim **30**, further comprising:

landing gear comprised of a main nose wheel and a main tail wheel mounted along the longitudinal axis of the fuselage; and

two outrigger landing gear mounted on extensions in front of the bottom wings

52. (new) The aircraft of claim **51**, wherein the outrigger landing gear includes outrigger wheels mounted in front of a junction of said midriggers with the bottom wing on both sides of the aircraft and the tail wheel is mounted at the rear end of a drivetrain truss.